EMBRYOLOGY OF THE PILL-BUGS.—An addition of much value to our knowledge of the mode of growth of crustacea is afforded by a Russian embryologist, Dr. Bobretzky in Siebold and Kölliker's "Zeitschrift." He figures the early stages of the pill-bug, or *Oniscus murarius*, of Europe.

THE ENTOMOSTRACA.—An extended and beautifully illustrated memoir by Prof. A. Weissmann, on the structure of *Leptodora hyalina*, a little European Entomostracan, or water-flea, appears in the last number received of Siebold and Kölliker's "Zeitschrift."

BOTANY.

A NEW MATERIAL FOR PAPER.—Considerable attention has recently been called in England to the capabilities of the *Zizania aquatica* as a material for paper. This grass grows in large quantities in swamps on the Canadian shores of Lakes Ontario and Erie, and is known to the native Indians under the name of "Tuscarora," the grains affording an article of diet which is both highly nutritious and palatable, and furnishing food to enormous flocks of wild swans. The culm grows to the height of eight or ten feet, and is of great strength and tenacity. It is said to possess all the good qualities of the "esparto" from the shores of the Mediterranean, now so largely used for paper making in England, and besides, to contain less silex, to require fewer chemicals for its purification, and to make a paper which takes printers' ink with greater sharpness. The great obstacle to its exportation is the heavy freight in consequence of its great bulk; but there is little doubt that if it could be at least partially prepared on this side the water, it might become an important article of commerce. It is stated that a company has been formed for the purpose of obtaining a concession of the land from the Canadian government. The grass is nearly allied to the rice belonging to the tribe Oryzeæ.—A. W. B.

THE MOVEMENT OF WATER IN PLANTS.—Dr. W. R. McNab of Dublin has performed a fresh series of experiments on the rate of motion of the sap in plants, and the transpiration of water from the leaves. The plants selected were the cherry-laurel (*Prunus laurocerœus*), elm and privet; and the results obtained were as follows: 1. That under favorable circum-

stances, a rate of ascent of 40 inches per hour can be obtained. 2. That, contrary to the generally received opinion, direct experiment has shown that the upward rapid current of water does not cease in the evening. 3. That checking the transpiration for a short time by placing the branch in darkness does not materially impede the rapid current of water. 4. That the removal of the cortical tissues does not impede the rapid current in the stem, which moves only through the woody (xyleus) portion of the fibro-vascular bundles. 5. That a well-marked rapid flow of fluid will take place in a stem after the removal of the leaves. 6. That fluid will rapidly flow downwards as well as upwards in the wood (xyleus) portion of the fibro-vascular bundles, as seen in a branch in which lithium citrate was applied at the top. 7. That pressure of mercury does not exert any very marked influence on the rapidity of flow, in the one experiment made with a pressure of 110·53 grammes of mercury. — A. W. B.

The Resurrection Fern. — *Polypodium incanium*, the commonest of all the ferns of Florida, is often called the resurrection fern. It grows mostly upon the trunks and branches of the oaks, and I have seen the roofs of old buildings covered with it. During dry weather it shrivels up, and has the appearance of being dead. While in this condition I secured some, wrapped them up in paper, and sent them in April last to Cambridge. On my return to that place in September last, the plants, after having moist moss placed about their roots, were secured to blocks of oak wood hung up in the greenhouse of the Botanic Garden. The leaves unfolded and assumed a bright green color. They now appear to be in a healthy condition. — E. Palmer.

The True Process of Respiration in Plants. — M. Claude Bernard pointed out long ago that the process ordinarily described as that of respiration in vegetables, the decomposition of the CO_2 of the atmosphere, is not properly of this nature at all, but is rather a process of digestion; the true process of respiration being of a precisely similar character in the animal and vegetable kingdoms, viz., an oxidation of the carbonaceous matters of the tissues. M. Corenwinder of Lille in France, has recently confirmed this view from a series of observations on the maple and lilac, proving that true respiration is always going on in a plant, even when concealed by the greater activity of the decomposition

of the CO_2 by the parts containing chlorophyll. He distinguishes two periods in the vegetative season of the plant: — the first period, when nitrogenous constituents predominate, is that during which vegetation is most active; the second, when the proportion of carbonaceous substance is relatively larger, is the period when respiration is comparatively feeble, the CO_2 evolved being again almost entirely taken up by the chlorophyll, decomposed, and the carbon fixed in the process of assimilation or digestion. He found that the proportion of nitrogenous matter in leaves gradually diminishes, while that of carbonaceous matter increases, between autumn and spring. — A. W. B.

MARTENIA PROBOSCIDES.—This is a very common plant in Arizona and is very productive. Its large seed pods after being deprived of their epidermis are used by all the Indian tribes of Arizona to ornament their willow baskets. The method resorted to is first to soften by means of water the black pods which are very hard. They readily soften, and are then straightened, split into the requisite strips and worked into willow baskets to form the black ornamentations seen in those made by all the tribes of Arizona.—EDWARD PALMER.

ZOOLOGY.

AN ADDITIONAL CHARACTER FOR THE DEFINITION OF RHYNCHOPHOROUS COLEOPTERA.[1] — On two former occasions I have invited the attention of my colleagues of the Academy to the relations which the Rhynchophorous Coleoptera bear to the other divisions of that order of insects. In the first of these I endeavored to show that they formed a group which was equivalent to all the others combined. The defining character of the group I stated to be, that the posterior lateral elements (the prothoracic epimera), of the under surface of the prothorax, coalesced on the median line, in such a manner as to form a longitudinal suture behind the end of the prosternum; in all other Coleoptera[2] the prosternum ends in a vacant space, or extends so as to take part in the articulation between the pro- and metathoracic segments. In the second memoir I attempted a sketch of the manner in which the group might be naturally divided into series and families.

[1] Read before the National Academy of Sciences, at Philadelphia, Nov. 5, 1874.
[2] Except in Cossyphus and a few Colydiidæ.